

## REMARKS

### I. Status of Claims

Claims 19-36 were pending.

Claims 19-26, 29-31, and 33-36 are rejected under 35 USC 102(e) as being anticipated by Chang et al. (US 7,359,345 B1).

Claims 27-28 and 32 are objected to as being dependent upon a rejected base claim.

Claims 19, 21, 23-31, and 36 have been amended.

Claim 20 is cancelled.

Claim 34 is cancelled.

New claims 37-45 have been added.

Claim 19 was amended by incorporating the subject-matter of claim 20 and by incorporating a new feature disclosed in paragraphs [0052] to [0056] of the description.

Claims 21, 23-31, and 36 were amended for consistency with amended claim 19, and to correct minor errors.

New claim 37 is supported by the description, lines 15 to 17 of paragraph [0025].

New claim 38 is supported by the description, paragraphs [0053] to [0055].

New claim 39 is supported by the description, lines 8 to 12 of paragraph [0025].

New claim 40 is supported by the description, lines 1 to 8 of paragraph [0025].

New claim 41 is supported by the description, lines 13 to 17 of paragraph [0027].

New claim 42 is supported by the description, paragraphs [0041] to [0044].

New claim 43 is supported by the description, paragraph [0048].

New claim 44 is supported by the description, paragraphs [0071] to [0072].

New claim 45 is supported by the description, paragraph [0074].

After entering these amendments, claims 19, 21-33, and 35-45 will be pending.

## II. Rejections under 35 U.S.C. § 112

Claim 34 was rejected under 35. U.S.C. § 112, first paragraph. Since claim 34 has been canceled, this rejection is moot.

## III. Rejections under 35 USC § 102

Claims 19-26, 29-31, and 33-36 are rejected under 35 USC § 102(e) as being anticipated by Chang et al. (US 7,359,345 B1).

The rejections and the Examiner's comments have been considered. For the reasons given below, it is believed that amended claim 19 is patentable over the cited prior art.

Chang et al. (US 7,359,345 B2, henceforth Chang) discloses a signalling method between a MAC layer entity of a transmission apparatus and a MAC layer entity of a reception apparatus in a packet communication system including the transmission apparatus and the reception apparatus. The method disclosed comprises the steps of: upon receiving a signaling request, transmitting a MAC signaling message including control information and a signaling indication indicating transmission of the control information by the MAC layer entity of the transmission apparatus, and determining by the MAC layer entity of the reception apparatus whether the MAC signaling message includes the signaling indication, and receiving the control information included in the MAC signaling message. All these features, according to Chang, relate to a signaling method for transmitting control information from the network to the receiving user equipment between MAC layers for High Speed Downlink Packet Access (HSPDA) in a communication system.

Furthermore, Chang discloses the structure of a general uplink Dedicated Physical Channel (DPCH) including Pilot, Transport Format Combination Indication (TFCI), Feedback Information (FBI), and Transmit Power Control (TPC) bits, and the structure of an uplink Dedicated Physical Channel (DPCH-1) including Channel Quality Indication

(CQI), Acknowledgement/Non-Acknowledgement (ACK/NACK), and Best Cell Indication (BCI) bits when High Speed Downlink Packet Access (HSPDA) is used. According to Chang, a field for transmitting MAC signaling indication is added to the Dedicated Physical Control Channel (DPCCH-1) for supporting the HSDPA, and MAC signaling control information is transmitted over an additional Dedicated Physical Control Channel DPCCH-2 including signaling type information and signaling content information. (cf. Chang col. 11, line 35 to col. 12, line 6)

Additionally, Chang discloses a method for correcting an error, if an error occurs, when an ACK/NACK signal is transmitted over an uplink for each data transport block transmitted over a downlink. According to the method disclosed, the network can recognize through MAC signalling which of the previously transmitted data blocks should be retransmitted when the User Equipment (UE) transmits e.g. a NACK signal to a network due to an error occurring in a received data transport block, but the network receives an ACK signal instead due to an error on a radio channel. When transmitting a NACK message through MAC signaling, this method transmits a second-or-later transmitted NACK message for the same data block along with signaling information containing the frequency of transmissions. (cf. Chang col. 12, lines 20-47)

By contrast, presently claim 19 of the present application, as amended, provides a method for transmitting data, comprising performing inband signaling of information relevant to the UMTS base station (BS) at the MAC layer level wherein for the inband signaling between a user terminal equipment (UE) and a respective UMTS base station (BS) a signaling transport block is introduced at the MAC layer level, wherein the signaling transport block comprises Buffer Status Report information signaling the data volume of the transport channel from the user terminal equipment (UE) to the UMTS base station (BS) at the MAC layer level.

The Buffer Status Report is a reply from the User Equipment (UE) to the Base Station (BS) in response to a Buffer Status Control message with signaling of the data volume of the dedicated uplink transport channel (cf. par. [0056] and [0089]). Thus, the

uplink information transmitted from the UE to the network includes specific information about the actual status of the transport channel concerning its capability for storing more incoming data packets.

In other words, the uplink information transmitted according to presently pending claim 19 comprises specific information about the status of the dedicated uplink transport channel, which the User Equipment UE provides to the network. By contrast, the uplink signaling of the method according to Chang merely includes a simple acknowledgement or non-acknowledgement signal and information about the frequency of transmission (cf. Chang col. 12, lines 20-47).

For the reasons given above, the subject-matter of presently pending claim 19 is novel over Chang et al., and the rejection of claim 19 as being anticipated by Chang et al. should be withdrawn.

Further, it is believed that the subject-matter of claim 19 would be non-obvious over Chang et al..

According to the subject-matter of amended independent claim 19, the method for transmitting data from a transmitter to a receiver operating in accordance with the Universal Mobile Telecommunications System standard (UMTS) disclosed, comprises performing inband signaling of information relevant to the UMTS base station (BS) at the MAC layer level wherein for the inband signaling between a user terminal equipment (UE) and a respective UMTS base station (BS) a signaling transport block is introduced at the MAC layer level, wherein the signaling transport block comprises Buffer Status Report information signaling the data volume of the transport channel from the user terminal equipment (UE) to the UMTS base station (BS) at the MAC layer level.

Thus, the subject-matter of presently pending claim 19 enables transmission of specific information about the status of the receiving apparatus from the User Equipment (UE) to the network's Base Station (BS) at a low layer level, so that the latter is able to

react quickly and specifically to specific sources of error, as e.g. to a buffer overflow of the transport channel on the receiving UE side, and is able to distinguish between different errors that may occur on layer-2 level, e.g. a failed error correction due to bad transmission conditions.

In contrast thereto, according to Chang, the UE transmits ACK/NACK messages and is able to do so repeatedly, if necessary, along with transmitting signaling information containing the frequency of transmission (cf. Chang par. 12, lines 43-45) to achieve retransmission of a certain defective transport block. This means that, according to Chang, the network just is able to retransmit defective transport blocks without having the possibility to react specifically to a channel status of a transport channel on the UE side.

The subject-matter of presently pending claim 19 includes the possibility of a high flexibility of the Base Station in responding to different specific demands/requirements concerning the data volume, i.e. the buffering status, of the dedicated transport channel or other error sources.

Chang does not give any hint to a skilled person to further improve the possibilities of the network of a communication system to be able to respond to other than simple signaling information from the UE about defective transport blocks that should be retransmitted.

Thus, the subject-matter of claim 19 as currently amended is believed to be non-obvious over Chang.

Since claims 21-26 and 29-31 depend from claim 19, they are believed to be patentable over Chang for at least the same reasons.

The rejections and the Examiner's comments with respect to claim 33 have been considered. For the reasons given below, it is believed that claim 33 as previously presented is patentable over the cited prior art.

Chang discloses a packet communications system including a transmission apparatus and a reception apparatus, in which a signaling method between a MAC layer entity of the transmission apparatus and a MAC layer entity of the reception apparatus is provided (cf. Chang col. 6, lines 25-30). A technique is provided in Chang for enabling a message exchange between MAC-hs layers of a Node B and a User Equipment UE (cf. Chang col. 6, lines 8-9).

In more detail, Chang discloses generating of a control message needed to service high-speed packet data and its transmission by RLC arranged in the Node B, wherein the RLC of the reception side analyzes this control message and performs necessary operations according to the results of the analysis. Due to a long time delay elapsing during communication between RLC arranged in the RNC and RLC arranged in the UE, Chang provides the technique for enabling a message exchange between MAC-hs layers of a Node B and a User Equipment UE (cf. Chang col. 5, line 60 - col. 6, line 9).

In contrast, presently pending claim 33 provides a communication system, wherein a plurality of RRC functionalities are disposed in the form of at least one control and/or data processing means transferred from the radio network control entity RNC to the base station (BS). In more detail, some of these functions are, for example, reconfiguration of physical channels in the uplink and downlink; reconfiguration of transport formats and transport format combinations in the uplink and downlink; switching of the transport channel type, i.e. from common transport channels to dedicated transport channels and vice versa; and setting of the uplink SIR<sub>target</sub> for fast performance control of dedicated physical channels.

In other words, according to presently pending claim 33, functions of RRC, which is part of the UMTS protocol stack and handles the control plane signaling of layer 3

between the UE and the UTRAN, are transferred to the Base Station. This means that, according to presently pending claim 33, functionalities of layer 3, namely functionalities of the Radio Resource Control layer, which conventionally belongs to the core network, and thus functionalities of a level above layer 2 are transferred to the Base Station.

In contrast thereto, RLC- and MAC-hs-entities provided by the technique according to Chang, both are implemented in layer 2, which means that conventionally both are elements of the Base Station or Node B, respectively (cf. Chang col. 5, line 60 - col. 6, line 9).

For the reasons given above, the subject-matter of presently pending claim 33 is novel over Chang et al., and the rejection of claim 33 under 35 U.S.C. § 102(e) over Chang et al. should be withdrawn.

Furthermore, the subject-matter of the independent claim 33 is believed to be non-obvious over Chang et al..

According to the subject-matter of claim 33, the communication system disclosed includes a Base Station, wherein a plurality of RRC functionalities are disposed in the form of at least one control and/or data processing means transferred from the radio network control entity RNC to the base station (BS).

Thus, the subject-matter of presently pending claim 33 supports an UTRAN protocol architecture with RRC functionality in the Base Station, so that radio resources can be managed closer to the air interface by inband signaling, but with higher layer functionalities. Consequently, reconfigurations of radio resources in the uplink and downlink can be carried out much more quickly and efficiently for a User Equipment. Hence, data transmission in the downlink and the uplink can be significantly improved in terms of transmission delay and data throughput.

In contrast thereto, according to Chang, the technique provided enables messaging between RLCs and/or MAC layers of Node B and UE, respectively, but does not talk about RRC or other higher layer functions necessary for data transmission control. Chang does not give any hint to a skilled person to improve data transmission by allowing fast and efficient control of radio resources by implementing the control of radio resources on RRC level in a Base Station.

Thus, the subject-matter of claim 33 as presently pending is believed to be non-obvious over Chang.

Claims 35 and 36 depend from claim 33, and are therefore patentable over Chang et al. for at least the same reasons.

#### IV. Conclusion

In view of the foregoing remarks, Applicants respectfully request reconsideration of this application and allowance of the pending claims.

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